

*Amendments to the Claims*

The listing of claims will replace all prior versions, and listings of claims in the application.

1-7. *(canceled)*.

8. *(previously presented)* A system comprising:

a forward error correction encoder that encodes a first signal to produce a second signal;

an interleaver that interleaves the second signal to produce a third signal;

a transmission system used to transmit the third signal;

a de-interleaver that de-interleaves the third signal and a possible error signal combined with the third signal to produce a fourth signal, such that any burst of the error signals is spread out; and

a forward error correction decoder that decodes the fourth signal to produce a fifth signal,

wherein the transmission system comprises first and second frequency domain multiplexed transceivers that transmit and receive the third signal and the possible error signal over one of a wire or wireless transmission medium.

9. *(previously presented)* A system comprising:

a forward error correction encoder that encodes a first signal to produce a second signal;

an interleaver that interleaves the second signal to produce a third signal;

a transmission system used to transmit the third signal;

a de-interleaver that de-interleaves the third signal and a possible error signal combined with the third signal to produce a fourth signal, such that any burst of the error signals is spread out; and

a forward error correction decoder that decodes the fourth signal to produce a fifth signal,

wherein the transmission system comprises first and second time domain multiplexed transceivers that transmit and receive the third signal and the possible error signal over one of a wire or wireless transmission medium.

10. *(previously presented)* A system comprising:
- a forward error correction encoder that encodes a first signal to produce a second signal;
  - an interleaver that interleaves the second signal to produce a third signal;
  - a transmission system used to transmit the third signal;
  - a de-interleaver that de-interleaves the third signal and a possible error signal combined with the third signal to produce a fourth signal, such that any burst of the error signals is spread out; and
  - a forward error correction decoder that decodes the fourth signal to produce a fifth signal,
- wherein the transmission system comprises first and second frequency domain-time domain multiplexed transceivers that transmit and receive the third signal and the possible error signal over one of a wire or wireless transmission medium.

11. *(canceled)*.

12. *(previously presented)* A system comprising:
- a forward error correction encoder that encodes a first signal to produce a second signal;
  - an interleaver that interleaves the second signal to produce a third signal;
  - a transmission system used to transmit the third signal;
  - a de-interleaver that de-interleaves the third signal and a possible error signal combined with the third signal to produce a fourth signal, such that any burst of the error signals is spread out; and
  - a forward error correction decoder that decodes the fourth signal to produce a fifth signal,

a first multiplexer that produces a plurality of first signals; and  
a second multiplexer that produces the fifth signal from a plurality of fourth signals,

wherein the encoding FEC and the decoding FEC include a plurality of encoding FECs and a plurality of decoding FECs, a number of each corresponding to a number of the plurality of first signals,

wherein the possible error signals are spread over the plurality of fourth signals.

13. *(original)* The system of claim 12, wherein the transmission system comprises a plurality of channels corresponding a number of the plurality of the first signals.

14. *(original)* The system of claim 13, wherein the plurality of channels have substantially equal signal-to-noise ratios.

15. *(canceled)*.

16. *(original)* A system comprising:  
a two-stage multiplexing system;  
a two-stage interleaving system, wherein each stage of the interleaving system is positioned subsequent to a corresponding stage of the multiplexing system;  
a transmission system coupled between a second stage of the interleaving system and a first stage of a two-stage de-interleaving system;  
a two-stage de-multiplexing system, wherein each stage of the de-multiplexing system is positioned subsequent to a corresponding stage of the de-interleaving system.

17.     *(original)* The system according to claim 16, wherein:  
          a first stage of the multiplexing separates a multi-dimensional input signal into each of its dimensions;  
          a first stage of the interleaving system interleaves each dimension of the input signal to form second signals;  
          a second stage of the multiplexing system distributes each bit of the second signal to one of a plurality of frequency tones; and  
          a second stage of the interleaving system interleaves each of the frequency tones of each of the second signals to form a transmission signal.

18.     *(original)*     The system according to claim 17, wherein:  
          a first stage of the de-interleaving system de-interleaves each of the frequency tones of each of the transmission signals and possible error signals combined with the transmission signals during transmission to form third signals;  
          a first stage of the de-multiplexing system combines all the frequency tones for each dimension of the third signal to form a fourth signal;  
          the second stage of the de-interleaving system de-interleaves each of the fourth signals to form fifth signals; and  
          a second stage of the de-multiplexing system combines the fifth signals to form a sixth signal.

19-21. *(canceled)*.

22.     *(previously presented)* The system of claim 8, wherein the first signal and second signal comprise multi-dimensional data.

23.     *(previously presented)* The system of claim 8, wherein the interleaver forms the third signal using a sequential interleaving pattern.

24. *(previously presented)* The system of claim 8, wherein the interleaver forms the third signal using a random interleaving pattern.

25. *(previously presented)* The system of claim 9, wherein the first signal and second signal comprise multi-dimensional data.

26. *(previously presented)* The system of claim 9, wherein the interleaver forms the third signal using a sequential interleaving pattern.

27. *(previously presented)* The system of claim 9, wherein the interleaver forms the third signal using a random interleaving pattern.

28. *(previously presented)* The system of claim 10, wherein the first signal and second signal comprise multi-dimensional data.

29. *(previously presented)* The system of claim 10, wherein the interleaver forms the third signal using a sequential interleaving pattern.

30. *(previously presented)* The system of claim 10, wherein the interleaver forms the third signal using a random interleaving pattern.